

### Claims

1-32. (withdrawn)

33. (original) A sampler, comprising:

a signal conductor;

a sampling diode in electrical communication with the signal conductor; and

a non-linear transmission line that includes a non-parallel waveguide and a plurality of varactors, the non-linear transmission line configured to deliver sampling strobe pulses to the sampling diode.

34. (original) The sampler of claim 33, further comprising an intermediate frequency (IF) waveguide configured to electrically connect to the signal conductor as controlled by the sampling diode.

35. (original) The sampler of claim 34, further comprising a measurement system configured to receive portions of an electrical signal applied to the signal conductor from the IF waveguide.

36. (original) The sampler of claim 35, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

37. (original) The sampler of claim 34, further comprising a measurement system configured to receive portions of an electrical signal applied to IF waveguide from the signal conductor.

38. (original) The sampler of claim 37, wherein the measurement system is configured to produce an equivalent-time representation of the electrical signal.

39. (original) The sampler of claim 33, wherein the non-linear transmission line includes a plurality of Schottky mesa diodes.

40. (original) The sampler of claim 33, wherein the non-parallel waveguide includes at least one periodically repeated waveguide section.

41. (original) The sampler of claim 33, further comprising a strobe waveguide transition configured to receive the sampling strobe pulses from the non-linear transmission line and to deliver enhanced strobe pulses to the sampling diode.

42. (original) The sampler of claim 33, wherein the non-parallel waveguide is a slotline.

43. (original) The sampler of claim 33, wherein the non-parallel waveguide is a coplanar stripline.

44. (original) A sampling circuit, comprising:  
a first waveguide configured to receive a sampling strobe and having a first impedance;  
a second waveguide configured to receive the sampling strobe from the first waveguide  
and having a second impedance, wherein the first impedance and the second impedance are  
configured to produce an enhanced sampling strobe; and  
at least one diode electrically controlled by the sampling strobe and configured to deliver  
a sampled portion of an input signal to an output conductor.

45. (original) The sampling circuit of claim 44, wherein the second waveguide includes  
a termination configured to direct an inverted portion of the enhanced sampling strobe to the  
sampling diode, thereby establishing a sampling window.

46. (original) The sampling circuit of claim 45, wherein the first waveguide and the  
second waveguide are slotlines.

47. (original) The sampling circuit of claim 45, further comprising an IF waveguide  
configured to deliver the sampled portion to the output conductor.

48-52. (withdrawn)

Respectfully submitted,

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